AGS Full Turn Fast Extraction Kicker System

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Project Goals

- To extract 11 or 12 bunches of particle beam from AGS ring in a single pulse
- To serve multiple experiments

Scope

- Design, Develop, Construct, and Install a new AGS Full Turn Extraction Kicker Power Supply System.
- Use existing AGS G10 lumped inductance ferrite magnet.
- Allowing future design and development of the transmission type magnet.

Parameter

Magnet dimension

Single turn C-type magnet

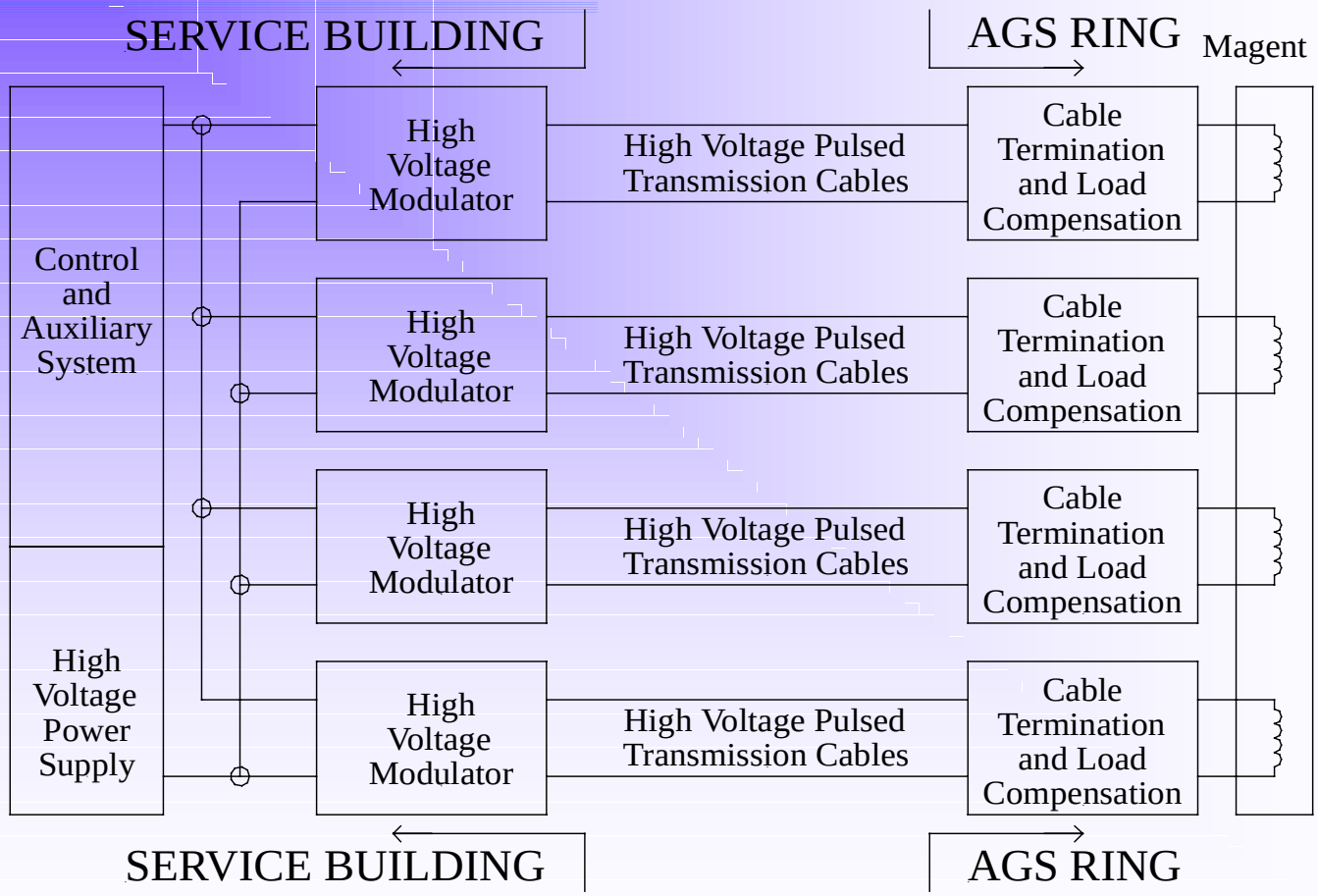
Window height	h = 2.2 cm
Window width	w = 3.2 cm
Magnet length / section	l = 53.3 cm
Space between sections	5.1 cm
Number of sections	N = 4
Total magnet length	leff = 2.413 m

Parameter

AGS Full Turn Fast Extraction Requirement (preliminary)

Bending angle	◆	-2.0	mrad
Maximum momentum	p	30	GeV/c
Kicker strength	Bleff	0.2002	T-M
Magnetic field	B	830	Gauss
Load magnet current	I	1651	A
Field rise time	tr	180 $\rightarrow$ 560	nS
Field flat top	tp	$\geq$ 2400	nS

System Description



AGS FULL TURN EXTRACTION KICKER SYSTEM

Technology Readiness & Challenge

- Extensive Experience on Fast Kicker System Design, Development, Integration, and Operation.
- Pulsed High Voltage System in AGS/RHIC range from 2kV to 100kV.
- Fast Kicker Systems with Transmission Cables -- RHIC Injection Kicker and Booster Tune Meter Kicker.

Technology Readiness & Challenge

- Available Space in the AGS Ring?
- Cable installation is difficult.
- High Voltage Cable and Connector reliability under high voltage and current stress.
- High Level Radiation effect on the Cable and Connector Materials.
- Modulator Building.

Team/Resources

- Scientist: BNL
- Electrical Engineers: BNL, LANL, and LLNL collaboration
- Mechanical Engineer: BNL
- Construction Team: BNL and Vendors.

Schedule (Preliminary)

- FY 2000: R&D, Test Stand.
- FY 2001: R&D , Start design, prototyping, and procurement.
- FY 2002: Design, procurement, and construction. (cable installation?)
- FY 2003: Construction, Integration, and Installation.